А.Л. Смирнов, Д.П. Зарифуллина
Уральский Федеральный Университет имени первого Президента России Б. Н. Ельцина
Екатеринбург, Россия

Как технология Big Data помогает нам?

Big Data (Большие Данные) является сравнительно новой технологией, которая в наши дни активно развивается. В данной статье рассматриваются сферы жизни, в которых данная технология нашла свое применение. Показано, что с использованием анализа Big Data увеличивается точность прогнозов и предсказаний, растет качество товаров и услуг, которые предлагаются только заинтересованным пользователям, а также разрабатываются новые методы и технологии для улучшения жизни.

How Big Data helps us?

The term Big Data has come into use recently. According to Google Trends the beginning of active growth of the phrase usage began in mid-2011 illustrated in Fig. 1.

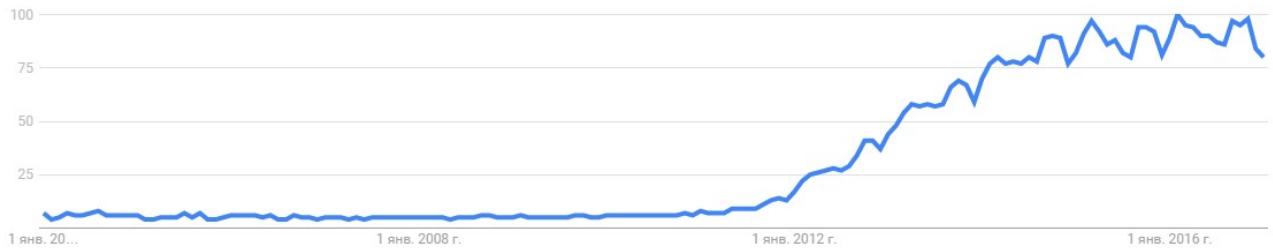

Fig. 1 Interest over time the term Big Data

The term Big Data is being increasingly used almost everywhere. Firstly, let’s understand what actually Big Data is.

Big Data is a phrase used to define a massive volume of both structured and unstructured data so large that it is difficult to process it using traditional database and software techniques. Among the challenges

are analysis, capture, data curation, search, sharing, storage, transfer, visualization, querying, updating and information privacy. The term "big data" often simply refers to use of predictive analytics, user behavior analytics, or other certain advanced data analytics methods that extract value from data, and seldom to a particular size of data set. [3]

Thus, Big Data is not any specific data volume or the data itself; this is a method of processing which allows processing information distributing.

Also, the crucial aspect here is that there is not just a lot of information: it's a volume constantly and rapidly growing, at that, data are often not structured and dissimilar.

These data include for example:

• Logs of user behavior on the Internet
• Information on the transactions of all the bank clients
• A text, images and a video
• Various statistics (e.g. reading of wearable gadgets)

In the grand scheme of things, data can be whatever one likes.

From a seemingly completely mindless flow of information one can not only get valuable information, but also predict on the basis pending events or behavior modification. This is exactly what is considered the major feature Big Data, thanks to which they can be applied in all areas of our lives.

Let's take a closer look at what areas of our lives Big Data have already been used in. [4]

Predicting Crime

Law enforcement institutions have found out how to use Big Data. National Security Agency is known to use Big Data tools to prevent terrorists' attacks. Others implement the promising methodology to prevent smaller scale crimes, too.

Since 2011 the Los Angeles police department, the first in the United States, has been putting to use analytical system, developed by the University of California, for forecasting locations and probability of crime commission. The algorithm is what's commonly referred to as predictive policing. The analytical system "learned" of the patterns using all the police reports, those are about 13 million offenses for 80 years and recent crime data. Using only three data points – crime type, crime location and crime date/time – this system provides each law enforcement agency with customized crime predictions for the places and times that crimes are most likely to occur. The system pinpoints small areas, depicted in 500 feet by

500 feet boxes on maps – that are automatically generated for each shift of each day. [6]

Today this system is used in police departments in Los Angeles, Atlanta and Santa Cruz.

Healthcare

The electronic health records are a system that takes information from a number of sources. Here is the information about patient's diagnoses, drugs they take, current health issues, medical procedures administered, test results, clinical notices. Electronic health records of this type are made capable of notifying patients about the need to undergo a new examination. In addition, the electronic health records provide following doctor's orders for supervising patients.

Also Big Data technologies implementation in medicine would allow studying diseases more thoroughly, and selecting treatment methods more efficiently, in every case. Analyzing information allows medical workers predict disease recurrence and take appropriate measures in advance. Diagnosing and treatment would be improved significantly.

Moreover, activity trackers are becoming more commonplace as personal monitoring devices to record steps taken, distances covered, and pulse rates. [1]

With the help of them, even if human health is normal, petabytes of information collected will form a flexible and constantly growing database. Just imagine that all this wealth of information can be "fed" IMB Watson, which is based on a large number of these patients. It will be able to recommend the best treatment for each of us. Neural networks will be able to identify the relationship between the data trackers and tendency to disease, helping others to learn about any illness beforehand.

Social networks

Recent research has shown that "Likes" in social networks help to know a person better than he/she knows oneself. Thus, we can find out if a person smokes or not, what kind of food he likes and how often he travels. Furthermore, we can accurately predict a range of highly sensitive personal attributes including: sexual orientation, ethnicity, religious and political views, personality traits, intelligence and happiness, addictions, family status, age and gender. And also it is possible to reveal a propensity for violence, alcoholism and even suicide, even when the person does not know about it.

According to experts, 68 "Likes" in the social network is enough to determine the color of a person's skin, sexual orientation and political

views. Over 70 “Likes” may help to know some information about the person which is only available to familiar friends. Over 150 “Likes” help to know a person better than his/her parents do, and over 300 “Likes” - more than his wife or husband knows about him/her. [2]

All this information can be used to improve numerous products and services. For example, digital systems and devices (such as online stores) could be designed to adjust their work to suit each user’s inferred profile better. Also, the relevance of marketing and product recommendations could be improved by adding psychological dimensions to current user models.

Five years ago, the use of the principles of Big Data has become a trend. Now Big Data is not an abstract concept, but it is an efficient set of technologies. The reason for this is clear. Digital technologies are developing rapidly; the volume of information is growing steadily, at the same time broadening the perspective for Big Data in real projects. Following the IDC Digital Universe forecasts, by 2020, the total volume of data on the planet will be 40 Zettabyte, which is equivalent to 5200 GB for every person on the Earth. [5]

This technology can be already useful in almost all areas of human activity: from medicine and enforcement of public order, to marketing and sales. And who knows what will be the role of Big Data in several years?

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А.А. Тарасьев, Д.Г. Уткина
Уральский федеральный университет имени первого Президента России Б.Н. Ельцина
Екатеринбург, Россия

Использование студенческих разработок для улучшения образовательного процесса

В последнее время разрабатываются новые экспериментальные методы повышения качества образования, проводятся различные исследования в этом направлении. Одним из важных направлений является вопрос повышения интереса студентов к образовательному процессу. В статье рассматривается один из экспериментальных методов данного направления, который заключается в непосредственном вовлечение студентов в разработку учебных материалов.

The use of student development to improve the educational process

The question of improving the quality of education is extremely relevant nowadays. Today there are many different methods to achieve it. Various studies have been conducted to develop new experimental